

domain or portion thereof an alanine at position 55 is substituted with a tyrosine, and a leucine at position 130 is substituted with a glutamic acid. ~

4-68. (NEW ) A soluble CTLA4 mutant molecule comprising:

- (a) an amino acid sequence beginning with methionine at position 27 and ending with aspartic acid at position 150 of SEQ ID NO.: 4, or
- (b) an amino acid sequence beginning with alanine at position 26 and ending with aspartic acid at position 150 of SEQ ID NO.: 4. ~

4-69. (NEW ) A soluble CTLA4 mutant molecule comprising:








- (a) an amino acid sequence beginning with methionine at position 27 and ending with aspartic acid at position 150 of SEQ ID NO.: 4 or a portion thereof that binds CD80 and/or CD86, or
- (b) an amino acid sequence beginning with alanine at position 26 and ending with aspartic acid at position 150 of SEQ ID NO.: 4 or a portion thereof that binds CD80 and/or CD86. ~

C1 4-70. (NEW) The soluble CTLA4 mutant molecule of claim 67, 68, or 69 further comprising an amino acid sequence which alters the solubility or affinity of the soluble CTLA4 mutant molecule. ~

4-71. (NEW) The soluble CTLA4 mutant molecule of claim 70, wherein the amino acid sequence amino acid sequence which alters the solubility or affinity comprises an immunoglobulin. ~

4-72. (NEW) The soluble CTLA4 mutant molecule of claim 71, wherein the immunoglobulin is an immunoglobulin constant region or portion thereof. ~

73. (NEW) The soluble CTLA4 mutant molecule of claim 72, wherein the immunoglobulin constant region or portion thereof is mutated to reduce effector function. *h*
74. (NEW) The soluble CTLA4 mutant molecule of claim 72 or 73, wherein the immunoglobulin constant region comprises a hinge, CH2 and CH3 regions of an immunoglobulin molecule. *z*
75. (NEW) The soluble CTLA4 mutant molecule of claim 72, wherein the immunoglobulin constant region or portion thereof is a human or monkey immunoglobulin constant region. *ex*
76. (NEW) A soluble CTLA4 mutant molecule comprising:
- (a) an amino acid sequence beginning with methionine at position 27 and ending with lysine at position 383 of SEQ ID NO.: 4, or
  - (b) an amino acid sequence beginning with alanine at position 26 and ending with lysine at position 383 of SEQ ID NO.: 4. *ex*
- C* 77. (NEW) A soluble CTLA4 mutant molecule consisting of:
- (a) an amino acid sequence beginning with methionine at position 27 and ending with lysine at position 383 of SEQ ID NO.: 4, or
  - (b) an amino acid sequence beginning with alanine at position 26 and ending with lysine at position 383 of SEQ ID NO.: 4. *ex*
78. (NEW) The soluble CTLA4 mutant molecule of claim 67, 68, 69, or 76 further comprising an amino acid sequence which permits secretion of the soluble CTLA4 mutant molecule. *~*

79. (NEW) The soluble CTLA4 mutant molecule of claim 78, wherein the amino acid sequence which permits secretion comprises an oncostatin M signal peptide. 
80. (NEW) A soluble CTLA4 mutant molecule comprising an amino acid sequence beginning with methionine at position 1 and ending with lysine at position 383 of SEQ ID NO.: 4. 
81. (NEW) A nucleic acid molecule encoding the soluble CTLA4 mutant molecule of claim 67, 68, 69, 76, 77 or 80. 
82. (NEW) The nucleic acid molecule of claim 81 comprising:
- (a) the nucleic acid molecule beginning with adenine at position 79 and ending with thymine at position 450 of SEQ ID NO:3, or
  - (b) the nucleic acid molecule beginning with guanine at position 76 and ending with thymine at position 450 of SEQ ID NO:3. 
- C 83. (NEW) The nucleic acid molecule of claim 81 comprising:
- (a) the nucleic acid molecule beginning with adenine at position 79 and ending with adenine at position 1149 of SEQ ID NO.: 3, or
  - (b) the nucleic acid molecule beginning with guanine at position 76 and ending with adenine at position 1149 of SEQ ID NO.: 3. 
84. (NEW) The nucleic acid molecule of claim 81 comprising the nucleic acid molecule beginning with adenine at position 1 and ending with adenine at position 1149 of SEQ ID NO.: 3. 
85. (NEW) A DNA molecule encoding a soluble CTLA4 mutant molecule, wherein the DNA molecule is deposited as ATCC No. PTA-2104. 

86. (NEW) A soluble CTLA4 mutant molecule encoded by the nucleic acid molecule designated ATCC No. PTA-2104. ~
87. (NEW) A vector comprising the nucleic acid molecule of claim 81. ~
88. (NEW) A vector comprising the DNA molecule of claim 85. ~
89. (NEW) A vector encoding a soluble CTLA4 mutant molecule and deposited with the ATCC as ATCC No. PTA-2104. ~
90. (NEW) A host cell having the vector of claim 87, 88, or 89. ~
91. (NEW) The host cell of claim 90 which is a bacterial or eukaryotic cell. ~
92. (NEW) The host cell of claim 91, wherein the eukaryotic cell is a COS cell or a Chinese Hamster Ovary (CHO) cell. ~
93. (NEW) A method for producing a soluble CTLA4 mutant molecule comprising growing the host cell of claim 90 so as to produce the soluble CTLA4 mutant molecule in the host cell, and recovering the molecule so produced. ~
94. (NEW) A soluble CTLA4 mutant protein produced by the method of claim 93. ~
95. (NEW) A soluble CTLA4 mutant molecule comprising the entire extracellular domain of the soluble CTLA4 mutant molecule encoded by the nucleic acid molecule designated ATCC No. PTA-2104. ~